

– **Mixture design:** art of arriving at optimum combination/ correct proportion of components

- Formulation associated with “recipe”.
- Started with pharmacy
 - Skills associated with development and execution of recipes have grown into an independent discipline
- In other fields of chemistry, particularly industrial chemistry, formulations are amongst a company’s most closely guarded **trade secrets** on account of their often considerable economic value.
- Formulation technology established in the areas of coatings, cosmetics and food

Formulation chemistry: Definition

- Formulation chemistry deals with
 - co-existence of several components in a mixture
 - and the combined and simultaneous activity of individual components.
- It is basically a science of mixtures coexisting without real chemical reactions
- Definition:
- Formulation chemistry is the branch of manufacturing that addresses substances that do not react with each other, but have desirable properties as a mixture to suit a particular application/use

- A *sustained release formulation* is an example for this.
- For example the active component (drug) in a capsule or tablet is released slowly in a sustained manner by other ingredients

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Page 13 of 26

Purpose of formulation

- Formulations are hyperactive (synergistic) compared to its individual components for a particular action or application, and this is the basic motivation for the design and development of a formulation.
 - SYNEGY: $1+1 > 2$
 - Two or more components in a formulation may act simultaneously in a synergetic fashion
 - i.e. higher degree of effectiveness than its individual components for a particular action or application

Formulation methodology

- Initial needs analysis
- Draft formula development that considers
 - raw material availability
 - cost along
 - production options to ensure product is produced in the most effective and efficient manner.
- Test batch production and evaluation to allow proof of product and market testing
- Scaled-up production